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Brief Report

Feasibility of monitoring compliance to the My 5 Moments and Entry/Exit hand hygiene methods in US hospitals

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We compared the ability to observe hand hygiene opportunities using the World Health Organization My 5 Moments method to the Entry/Exit method. Under covert direct observation, Entry/Exit method opportunities were observed at all times. My 5 Moments were observable in 32.3% of episodes, with a lower rate in wards versus intensive care units (28.0% vs 39.4%; $P < .01$). In US hospitals, the Entry/Exit method appears to be more feasible for directly observed hand hygiene compliance monitoring due to line-of-sight issues and other barriers.

High levels of hand hygiene compliance have been associated with reduced health care-associated infections.[1] Direct observation of hand hygiene practices during routine patient care is currently considered the gold standard for hand hygiene monitoring.[2] However, protocols for hand hygiene monitoring vary by facilities, often influenced by resource limitations or leadership engagement.[3] In addition, the current hand hygiene guidelines may soon need updating.[4,5] One method for hand hygiene monitoring is the World Health Organization My 5 Moments for Hand Hygiene (M5M). M5M captures the 5 major points of pathogen transmission during routine health care encounters.[6] Another method that is routinely applied is room entry and exit monitoring (Entry/Exit method). This report aims to compare the feasibility of each method in US clinical settings in a multicenter trial, where observations occur outside patient rooms for privacy protection and to minimize the Hawthorne effect.

METHODS

Hand hygiene compliance data were prospectively collected from June 4-November 13, 2013, in 3 acute care hospitals (Baltimore Veterans Affair Health Care System [VAHCS], Iowa City VAHCS, and Portland VAHCS). Observations were performed in 5 intensive care units (ICUs) and 6 surgical/medical wards. Covert observers in hallways outside of the patient rooms collected the observations in 10-minute intervals to reduce bias secondary to the Hawthorne effect, as shown in prior studies.[7,8] During each observation period, the observers recorded hand hygiene activity of all clinical and nonclinical personnel entering and exiting the rooms. If specific hand hygiene moments were blocked from view, they were marked as unobserved. If a hand hygiene moment did not occur (eg, before aseptic task), it was labeled "Not Applicable." Each episode recorded consists of the first instance of each room Entry/Exit method and M5Ms hand hygiene opportunity in the period between when the same health care worker entered and exited a patient room. If the health care worker entered and exited a room multiple times, each separate entry and exit was recorded as a distinct episode. The data for both methods were collected concurrently. Each institution's institutional review board approved this study.

Moment-specific compliance rates were calculated based on the number of opportunities observed for each moment for M5Ms. Overall compliance rates for M5Ms and Entry/Exit method

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Table 1
Observability of the World Health Organization My 5 Moments for Hand Hygiene, by ward type*

Ward type	Observed	Unobserved†	Total	Odds ratio (95% confidence interval	P
Surgical/medical	317 (28.0)	814 (72.0)	1,131	0.60 (0.49-0.73)	<.01
Intensive care unit	264 (39.4)	406 (60.6)	670		
Total	581 (32.3)	1220 (67.7)	1,801		

NOTE. Values for observed and unobserved are presented as n (%).
*Variables are collapsed (eg, If 1 opportunity of the My 5 Moments for Hand Hygiene was observed, it counted as observed for the whole episode of an individual being in a patient room).
†Unobserved indicates when the opportunity may have occurred during the observation period, but were not seen by the observer (ie, closed doors or drawn curtains).

Table 2
Overall and moment-specific hand hygiene compliance rates*

	Overall		Surgical/medical		Intensive care unit		
Moment	No. of Opportunities	Compliance	No. of Opportunities	Compliance	No. of Opportunities	Compliance	Opportunities observed (per 1,801 episodes)
Entry/Exit	2,709	59.5%	1,733	39.7%	976	55.0%	
Entry	1,297	50.1%	827	36.5%	470	37.7%	72.0%
Exit	1,412	68.1%	906	42.6%	506	71.2%	78.4%
My 5 Moments for Hand Hygiene	1,073	73.8%	564	40.8%	509	69.2%	
Before contact							
Moment 1: Contact	341	82.1%	153	35.3%	188	54.6%	18.9%
Moment 2: Aseptic	83	62.2%	41	37.8%	42	47.6%	4.6%
After contact							
Moment 3: Fluid	80	53.2%	38	30.4%	42	42.9%	4.4%
Moment 4: Contact	227	73.9%	135	48.7%	92	62.0%	12.6%
Moment 5: Surrounding	342	73.0%	197	44.3%	145	67.6%	19.0%

*Each moment of opportunity is a distinct instance from another moment.

opportunities were calculated using aggregated opportunities observed for all units. Odds ratios comparing the hand hygiene observation rates when using the M5Ms were calculated by setting (ICU or general surgical/medical ward). The observation rate was defined as the number of completed hand hygiene opportunities over the number of observed opportunities. Opportunities labeled "Unobserved" or "Not Applicable" were removed from the compliance rate analysis.

RESULTS

During the 5-month study period, 1,801 episodes of individuals in a patient room were observed with 670 in ICU settings, and 1,131 in the surgical/medical wards. At least 1 of the M5Ms was observed for 581 of the 1,801 episodes (32.3%). Additionally, odds of observing M5Ms were lower in surgical/medical wards compared with ICU settings (odds ratio [OR], 0.5989; 95% confidence interval [CI], 0.4893-0.7331; $P < .0001$) (Table 1). Multiple-bed rooms allowed for a higher rate of M5M observation (57.2%) than single-bed rooms (28.9%). One thousand two hundred ninety-seven entry hand hygiene opportunities were observable and 341 opportunities before patient contact (moment 1) were observable (Table 2). A similar number (n = 342) of opportunities after touching patient surrounding (moment 5) were observable. Of the other M5Ms, 83 aseptic tasks (moment 2), 80 fluid exposures, and 227 after patient contact opportunities were observable. Hand hygiene compliance rates observed using M5Ms were higher than those collected using Entry/Exit method (73.8% vs 59.5%; $P < .01$). Results were consistent across sites.

DISCUSSION

Although there are several possible methods for directly observing hand hygiene compliance, the majority of US hospitals tend to use 1 of 2 methods: M5M or Entry/Exit.[3] Many novel automated surveillance technologies have been developed and adopted, but no method has yet supplanted directly observed hand hygiene compliance as the gold standard.[8,9] During direct observation, physical barriers may block the line of sight of observers. In locations such as general medical or surgical wards, the doors are frequently closed to ensure patient privacy; in ICU wards, the doors and walls are often made of transparent glass. This may explain the increased likelihood of observing hand hygiene opportunities using M5Ms in ICU wards versus general wards. However, even in ICU settings, privacy curtains may limit the utility of M5Ms. On the other hand, these physical constraints do not limit the Entry/Exit method. Because most US facilities have wall-mounted alcohol handrub stations outside patient rooms due to fire code regulations, it is significantly easier to observe Entry/Exit compliance with hand hygiene practices compared with M5M. As noted, the ability to observe M5M opportunities was higher in multiple-bed rooms compared with private rooms. This suggests that doors were kept open when patient-care activities were preformed in multiple-bed rooms, a trade-off between patient privacy and ability to monitor M5M.

In addition to opportunities for observation, distinct differences in methodologies must also be considered. For example, previous reports have assumed that the moments in the Entry/Exit method are comparable to moments 1 and 4 in the M5M method, whereas moments 2, 3, and 5 rarely occur.[10] However, we were able to observe many more entries and exits than opportunities before and after patient contact. In addition, opportunities to perform hand hygiene after touching patient surroundings (moment 5) was observable the same number of times as before patient contact, whereas opportunities after patient contact were less frequently observable. These results indicate patient contact and touching patient surroundings occurs more frequently before curtains are drawn and the field of observation is obstructed. However, this study was limited by its reliance on directly observed hand hygiene compliance. Although efforts to limit the Hawthorne effect were included in the study design, it is possible that some observation bias remained. Additionally, the compliance rates being recorded are dependent on the ability to observe; therefore, the differences in compliance rates between the 2 methods may not reflect the true compliance but rather, observed compliance.

CONCLUSIONS

Whereas the M5M method may better approximate hand hygiene effectiveness, the feasibility of directly observing hand hygiene compliance using M5M is currently limited in US hospitals. Physical barriers represent the most significant obstacle in the implementation of M5M methodology. When deciding on a specific observation method, infection prevention programs need to take into account the physical infrastructure of their hospital to maximize the utility of their hand hygiene compliance monitoring efforts.

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